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A new species of *Ananteris* (Scorpiones: Buthidae) from Caatinga biome, Brazil

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Abstract — We describe a new species of scorpion from the Caatinga of the state of Pernambuco, Brazil. *Ananteris otavianoi* sp. nov. can be distinguished from other *Ananteris* by the following combination of characters: blackish brown spots up to the medial surface of the chelicerae; pectinal tooth count and some structures measurements. In addition, data on natural history are showed and discussed.

Key words — *Ananteris otavianoi* sp. nov., Pernambuco, scorpion, semiarid, taxonomy

Introduction

Ananteris Thorell 1891 is a Neotropical genus of scorpions with records for South and Central American countries (Lourenço 1985; Lourenço 2004; Botero-Trujillo & Flórez 2011). It comprises small-sized animals (14–40 mm), showing a yellowish to reddish brown color with several darker spots, chela fingers with 6–7 longitudinal rows of granules without supernumerary granules, legs III and IV with tibial spurs and pectines without fulcra, and 11 to 22 teeth (Lourenço 2002).

This genus was originally described by Thorell (1891) for *Ananteris balzanii* from the state of Mato Grosso, Brazil. Before the review of the genus by Lourenço (1982), only five species were recognized (*A. balzanii* Thorell 1891, *A. cussinii* Borelli 1910, *A. festae* Borelli 1899, *A. venezuelensis* Gonzáles-Sponga 1972 and *A. ashmolei* Lourenço 1981). After the revision, the number of described species increased to eleven. Since then, the species descriptions continue to increase, currently being recognized 83 species of *Ananteris* (González-Sponga 2006; Lourenço 2012; Lourenço et al. 2013; Lourenço 2016).

This genus is widely distributed in Brazil and can be found both in open vegetation formations, such as Cerrado and Caatinga, and in closed forested areas, such as Amazonian and Atlantic Forests (Lourenço 2004). In the northeast region, only ten species of *Ananteris* have been recorded (Lourenço 2002; Lourenço et al. 2013). In the present study, *Ananteris otavianoi* sp. nov. is described from Caatinga biome and constitutes a third record of confirmed species of this genus in the state of Pernambuco, Brazil. In addition, natural history comments about the new species are discussed.

Materials and methods

Specimens were collected in the municipality of Buíque (08°35′08.2″S, 37°14′29.3″W), Pernambuco State, Brazil (Fig. 1). The sampling area is inserted on Caatinga biome (Fig. 2). This environment has a semiarid climate, with low precipitation (300–1000 mm/year) concentrated in a short period of 3–5 months (Sampaio 1995). The scorpion samples were taken in February-2015.

Illustrations were made with the aid of photos taken with a Canon A620 camera attached through an adapter to a Leica MZ6 stereomicroscope and the drawings were made from the photos on Corel Draw X7, with a Wacom bamboo tablet. The measurements were performed with a digital caliper, according to Stahnke (1970), and are given in mm. Trichobothrial notations follow Vachon (1974) and the morphological terminology mostly follow Vachon (1952) and Hjelle (1990). The type specimens are deposited in the Arachnological Collection of the Universidade Federal de Pernambuco, Brazil.

Taxonomy

Ananteris Thorell 1891
Ananteris otavianoi sp. nov. (Figs. 3–9)

Type material. Male holotype: Brazil, *Pernambuco*: Buíque (08°35′08.2″S, 037°14′29.3″W), 27.II.2015, A. F. A. Lira (CA-UFPE #1502). Paratypes: Brazil, *Pernambuco*: Buíque (08°35′08.2″S, 037°14′29.3″W), 06.VIII.2015, A. F. A. Lira, 1 male (CA-UFPE #1503), 3 females, idem, 27.II.2016, A. F. A. Lira (CA-UFPE #1504–1505), 2 males, idem, 27.II.2016, A. F. A. Lira (CA-UFPE #1506–1507).

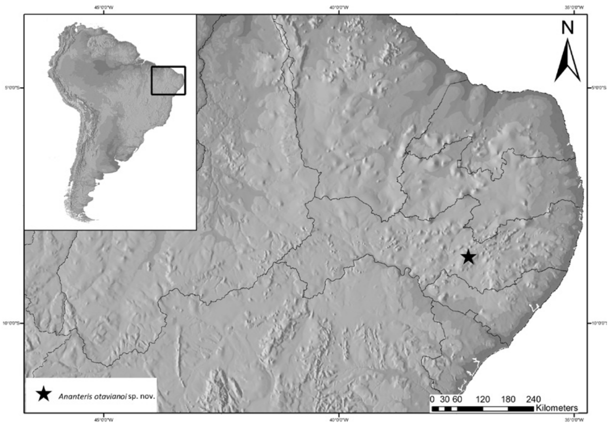

Fig. 1. Geographic distribution of *Ananteris otavianoi* sp. nov.

Fig. 2. Habitat of *Ananteris otavianoi* sp. n., Caatinga, Buíque, Pernambuco State.

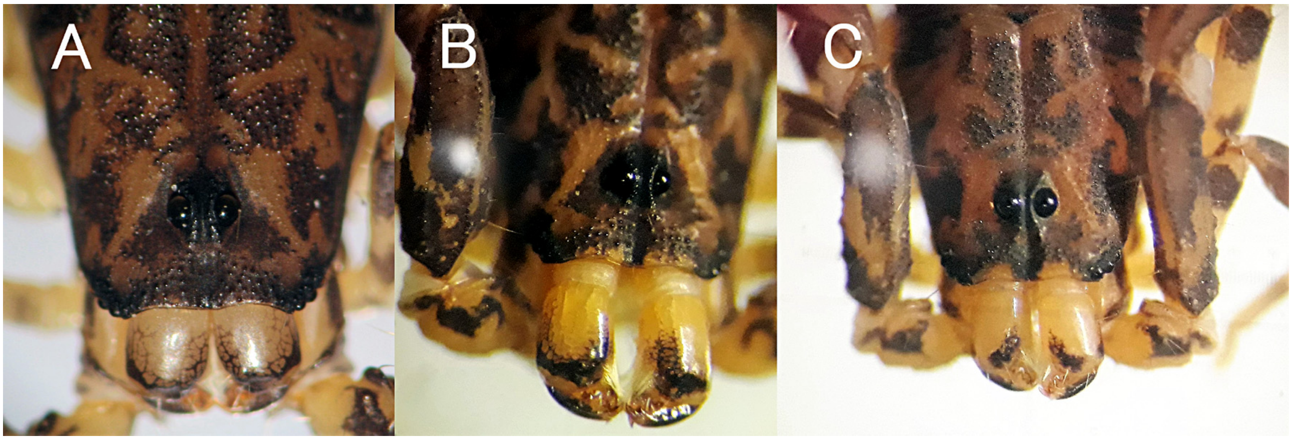

Fig. 3. Carapace and chelicerae in detail, showing pigmentation pattern. A, *Ananteris otavianoi* sp. n.; B, *Ananteris mauryi* Lourenço 1982; C, *Ananteris franckei* Lourenço 1982. Photos by Roberto Araújo.

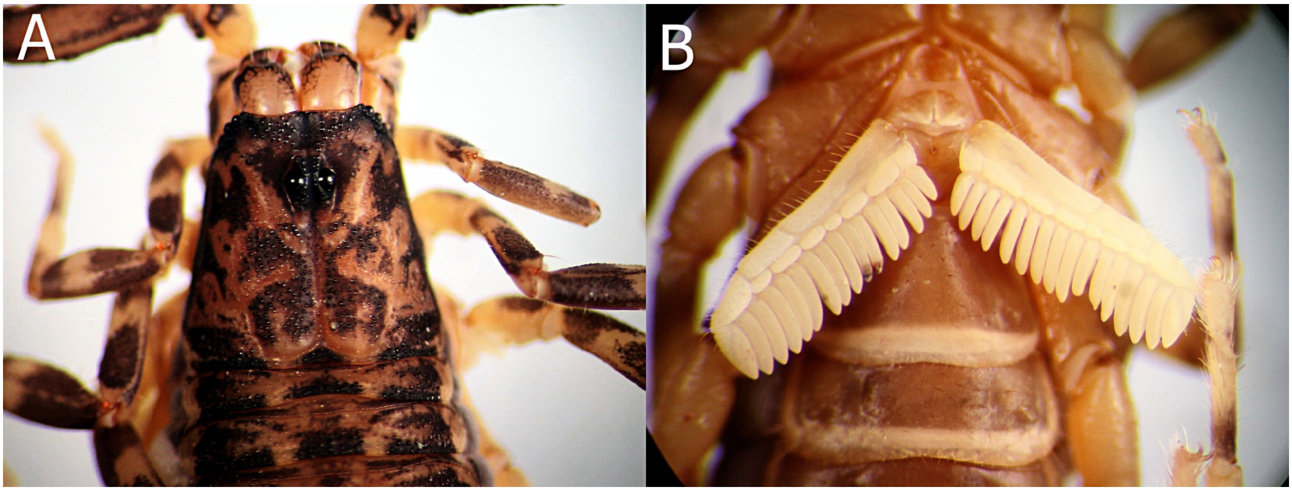

Fig. 4. *Ananteris otavianoi* sp. n., male holotype. A, carapace and chelicerae in detail, showing pigmentation pattern; B, ventral aspect showing sternum, genital operculum and pectines.

Diagnosis. Individuals of *A. otavianoi* sp. nov. shows affinities on coloration pattern with *A. mauryi* Lourenço 1982 and *A. franckei* Lourenço 1982. The new species can be distinguished from congeners by the following combination of characters: blackish brown spots up to the middle surface of the proximal segment of chelicerae (Fig. 3); pectinal tooth count 14 (in females) and 15–16 (in males) (Figs. 4–5); some morphological measurements (Table 1).

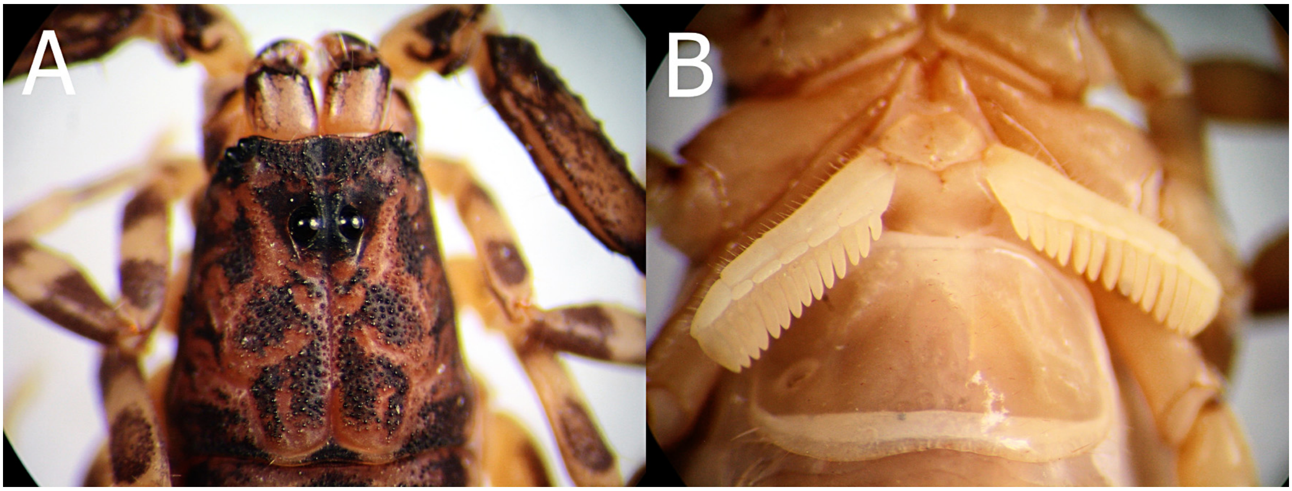

Fig. 5. *Ananteris otavianoi* sp. n., female paratype. A, carapace and chelicerae in detail, showing pigmentation pattern; B, ventral aspect showing sternum, genital operculum and pectines.

Table 1. Morphometric values (in mm) and pectinal tooth count of the male holotype and female paratype of *Ananteris otavianoi* sp. n. and of the female holotypes of *Ananteris mauryi* and *Ananteris franckei*. *Data from Lourenço 1982.

	Ananteris otavianoi holotype male	*Ananteris otavianoi* paratype female	*Ananteris mauryi* holotype female*	*Ananteris franckei* holotype female*
Total lenght	21.9	25.6	24.9	28.1
Prossoma				
Length	2.2	2.8	2.6	3.1
Anterior width	1.2	1.9	1.9	2.1
Posterior width	1.8	2.9	2.8	3.3
Mesosoma				
Length	4.7	7.3	7.0	8.3
Metasomal segment I				
Length	1.3	1.3	1.7	1.6
Width	1.1	1.6	1.6	2
Metasomal segment V				
Length	3	3.9	3.6	3.9
Width	1.2	1.4	1.5	1.7
Depth	0.9	1.5	1.5	1.7
Telson				
Length	2.8	3.1	2.4	2.5
Width	0.4	0.8	0.9	1
Depth	0.4	0.7	0.8	0.9
Pedipalp				
Patela length	2.1	3.2	3.4	3.3
Patela width	0.5	0.8	0.8	1.1
Femur length	1.9	2.2	2.6	2.8
Femur width	0.1	0.4	0.8	0.8
Chela length	2.9	4	4	4.1
Chela width	0.2	0.5	0.7	0.8
Chela depth	0.3	0.4	0.7	0.8
Movable finger length	2.1	2.9	3.1	3.1
Pectinal tooth count	16	14	15	15

Description. Based on the male holotype (CA-UFPE#1502), male paratypes (CA-UFPE#1506–1507) and female paratypes (CA-UFPE#1503–1505). **Measurements.** Males (the values shown by the holotype and the ranges based on the holotype + two paratypes in parentheses). Total length 21.9 (14.3–21.9). Prosoma: length 2.2 (2–2.2); anterior width 1.2 (1.2–1.5); posterior width 1.8 (1.8–2). Mesosoma length 4.7 (3.8–4.7). Metasomal segment I: length 1.3 (0.9–1.3); width 1.1 (0.8–1.1). Metasomal Segment V: length 3 (2.7–3); width 1.2 (0.9–1.2); depth 0.9 (0.9–1). Telson: length 2.8 (2.4–2.8); width 0.4 (03.3–0.4); depth 0.4 (0.4–0.5). Pedipalp: patela length 2.1 (2.1–2.6); width 0.5 (0.3–0.5); femur length 1.9 (1.7–2); width 0.1 (0.1–0.3); chela length 2.9 (2.7–2.9); width 0.2; depth 0.3 (0.3–0.4); movable finger length 2.1 (1.8–2.1). Pectinal tooth count 15–16. Females. Measurements (CA-UFPE

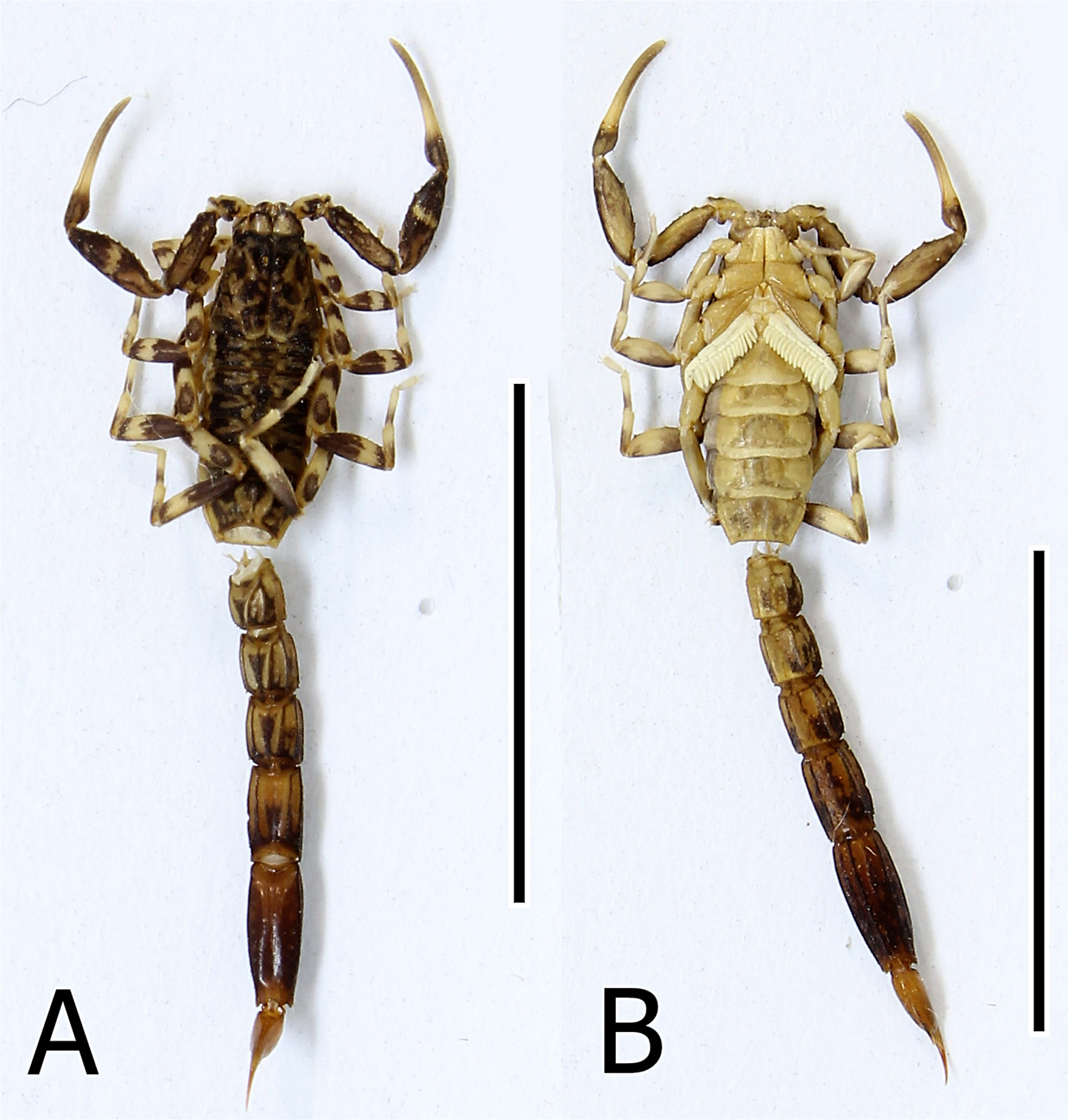

Fig. 6. *Ananteris otavianoi* sp. n., male holotype. A, dorsal aspect; B, ventral aspect. Scales = 1 cm. Photos by Rafael Barros.

#1502). Total length 24–27. Prosoma: length 2.6–2.9; anterior width 1.8–2; posterior width 2.4–3. Mesosoma length 7.1–7.3. Metasomal segment I: length 1.3–1.6; width 1.4–1.6. Metasomal Segment V: length 3.7–4; width 1.3–1.5; depth 1.3–1.5. Telson: length 2.5–3.3; width 0.7–0.8; depth 0.6–0.7. Pedipalp: patela length 2.9–3.2; width 0.6–0.9; femur length 2.2–2.5; width 0.4–0.5; chela length 3.7–4.2; width 0.4–0.5; depth 0.4–0.6; movable finger length 2.6–2.9. Pectinal tooth count 14. **Coloration.** General coloration yellowish brown with dark variegated pigmentation over the entire body and appendages. **Prosoma.** Yellowish brown with darker brown spots on anterior, lateral and posterior margins; ocular tubercle surrounded by a darker brown triangle; Chelicerae pale yellow with variegated blackish spots on lateral and anterior regions; fingers blackish; teeth reddish. Pedipalps yellowish; femur, patella and chela hand marked with dark brown spots; chela fingers pale yellow to brownish yellow with tip blackish. Legs pale yellow strongly marked with dark brown spots. Sternites and coxosternal yellow with pale yellow edges and a dark

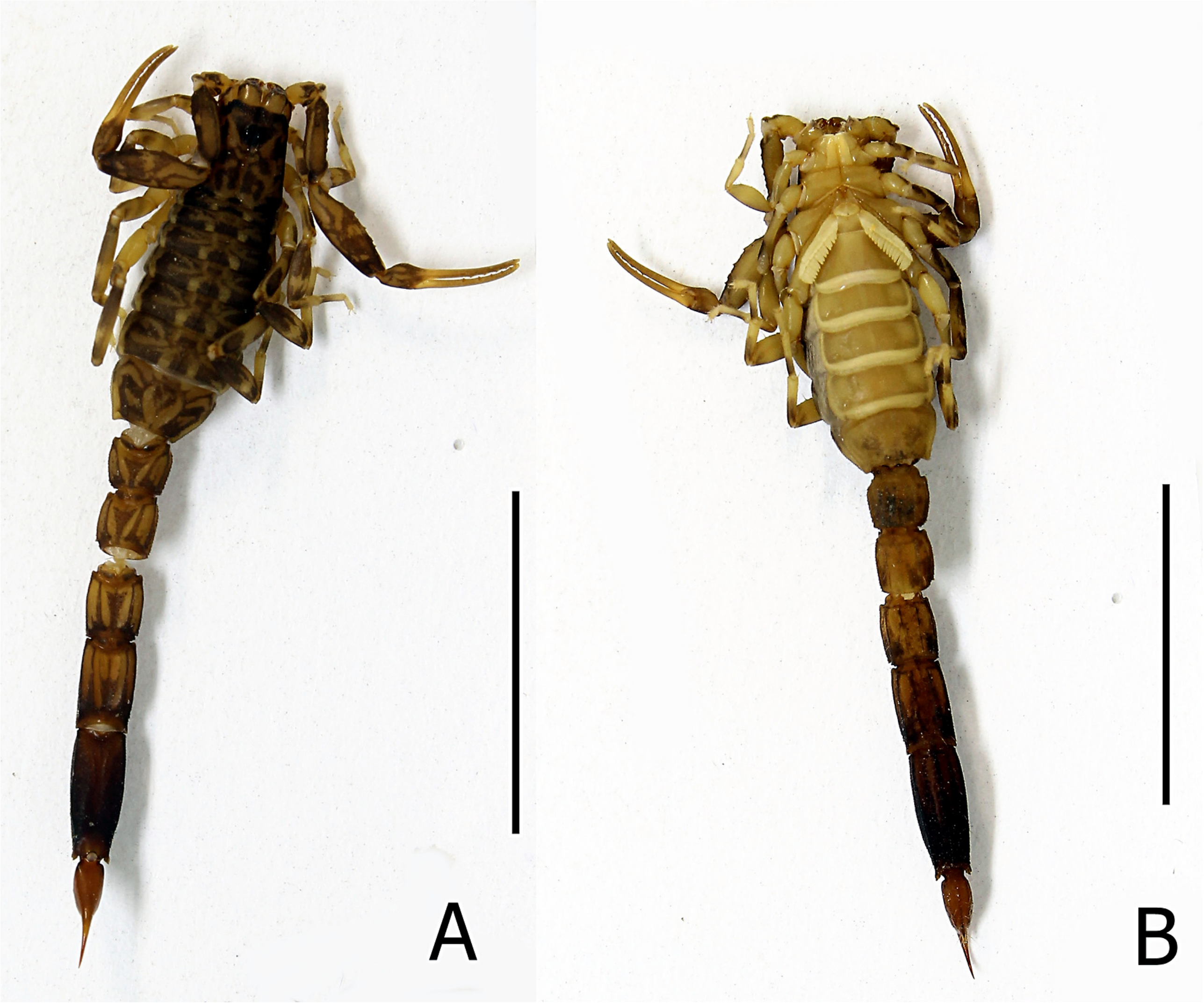

Fig. 7. *Ananteris otavianoi* sp. n., female paratype. A, dorsal aspect; B, ventral aspect. Scales = 1 cm. Photos by Rafael Barros.

spots on sternite V. Pectines pale yellow. **Mesosoma.** Yellowish with confluent darker brown stripes on tergites. **Metasoma.** Segments I–III yellowish; IV–V brownish-yellow; all segments strongly marked with darker brown spots. Vesicle brownish-yellow without spots; base of aculeus brownish-yellow, tip reddish. **Morphology. Prosoma.** Strongly marked granulation, anterior margin not emarginated shallowly bi-concave. All carinae weak or absent: furrows moderate. Median ocular tubercle distinctly anterior to centre of carapace; median eyes separated by approximately one ocular diameter. Three pairs of lateral eyes and one pair of ocelli according to 4-A pattern (Loria & Prendini 2014). Cheliceral dentition characteristic of family Buthidae (Vachon 1963); fixed finger with two strong basal teeth; movable finger with two weak basal teeth; ventral surface of both finger and manus with long, dense setae. Pedipalp femur bicarinate; patella and chela with vestigial carinae; internal surface of patella with 4–6 spinoid granules; all surfaces weakly granular. Fixed and movable fingers with 6 and 7, almost linear, rows of granules; two small external and one internal accessory granule present at base of each row; three granules at extremity of the fingers. Trichobothriotaxy; orthobothriotaxy A-β-beta (Vachon 1974; Vachon 1975); trichobothria *est* located basal to the trichobothria *db* (Fig. 8). Venter. Sternum subpentagonal: genital operculum divided longitudinally, each plate triangular in shape with rounded edges. Pectines: pectinal tooth count 15–16 in males (Fig. 4B) and 14 in females (Fig. 5B). Basal middle lamellae of pectines not dilated; fulcra absent. Legs. Tarsus with very numerous, fine, median setae ventrally. Tibial spurs strongly developed on leg IV and III, pedal spurs weakly on leg I, moderate on II and III and strong and bifid on IV. **Mesosoma.** Mesosomal tergites with moderately to strongly marked granulations, as intense as those of carapace. Tergites I with carina absent, tergites II to III with a weakly central carina, tergites IV to VI with a central carina, tergite VII with seven carinas. Sternites smooth. Sternite VII with a weak to moderate median

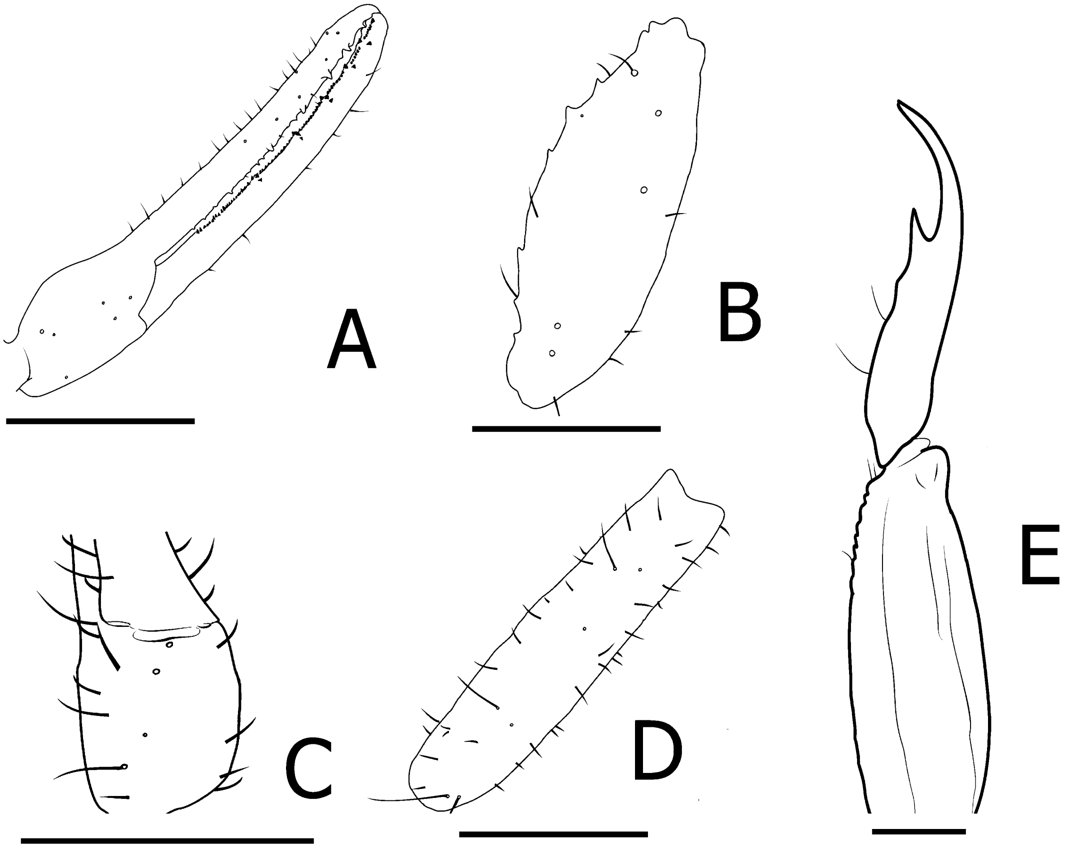

Fig. 8. *Ananteris otavianoi* sp. n., male holotype. A, chela of right pedipalp, dorso-external aspect; B, patella, dorsal aspect; C, chela, ventral aspect; D, tibia, dorsal aspect; E, metasomal segment V and telson, lateral aspect. Scales = 1 mm.

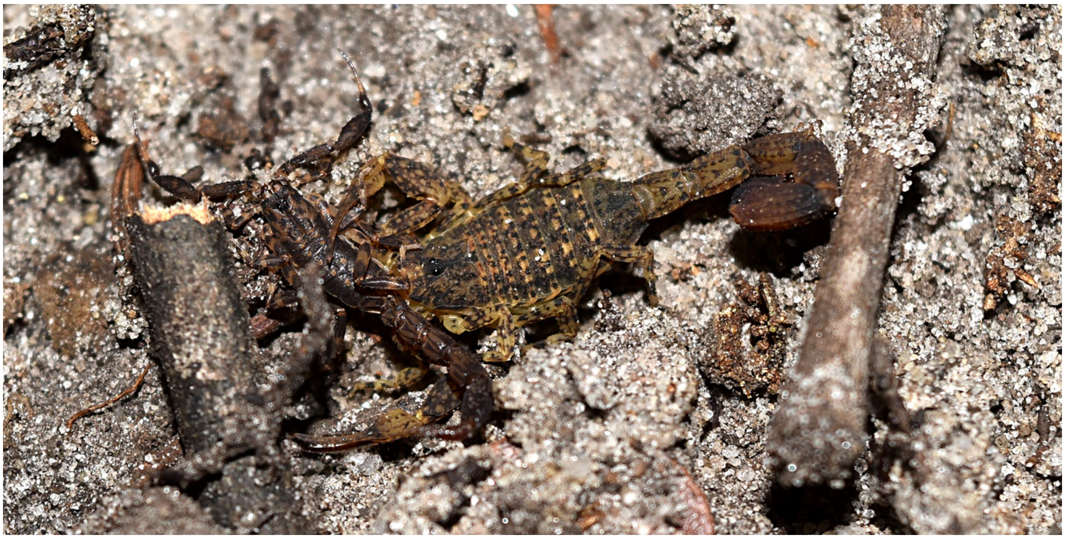

Fig. 9. Adult of *Tityus pusillus* Pocock 1893 feeding on an adult of *Ananteris otavianoi* sp. nov.

bicarinate; spiracles moderately elongate; setation moderate in male. **Metasoma.** Segments I to IV with 10 carinae, crenulate; segment V slightly rounded, with 5 carinae; dorsal carinae on segments I to IV with one to three distal spinoid granule; intercarinal spaces moderately weakly in males and granular in females. Telson elongated in males (Fig. 6) and moderately elongated in females (Fig. 7), with some granulations; aculeus large and weakly curved; subaculear tooth moderately to strongly marked and spinoid. Carina absent in males and present in females by two ventral carinae.

Etymology. A tribute to Mr. Otaviano Pereira de

Araújo, which started the first author in the natural sciences.

Natural history comments. The specimens of *A. otavianoi* sp. nov. were found foraging on sub-leaf litter. This species shows superficial behavior and microhabitat similar to those described for *Ananteris mauryi* Lourenço 1982 in an Atlantic forest remnant (Lira et al. 2013). According to Lourenço (2015), humicolous scorpions such as *Ananteris* are restricted to moist conditions, although these must not be so wet that they engender waterlogging. On the other hand, increased activity makes these arachnids more vulnerable to predation, as recorded for *Tityus pusillus* Pocock 1893 preying on *A. otavianoi* (Fig. 9). This record of intraguild predation (IGP) was the first report of this event by scorpions inhabiting the Caatinga biome. Records of IGP for scorpions on Neotropical forests are scarce and are associated to a predator-prey size relationship (Moreno-González 2012; Lira et al. 2017). Finally, autotomized individuals were also registered (males, n=7). This mechanism is associated to antipredator strategies and was recorded for several other species of *Ananteris* (Lira et al. 2014; Mattoni et al. 2015; Bhukal 2016), being suggested as a synapomorphy of the genus (Mattoni et al. 2014).

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